

Tutorial No. 2 : OSI model

Exercise 01: CCNA1 Quiz - The OSI Model (choose one or more answers with justification)

1. The frame is a protocol data unit (PDU) of the:
 - a. Application layer.
 - b. Presentation layer.
 - c. Session layer.
 - d. Transport layer.
 - e. Network layer.
 - f. Data Link layer.
 - g. Physical layer.
2. The transport layer of the OSI model is responsible for:
 - a. delivering messages end-to-end across the network.
 - b. routing packets based on a unique network address.
 - c. standardizing data formats between systems.
 - d. defining access procedures to the medium.
3. The OSI layer responsible for directing data to a specific service using a logical port number is the
 - a. Network layer.
 - b. Transport layer.
 - c. Session layer.
 - d. Presentation layer.
4. What type of addressing is found at Layer 2 of the OSI model? (choose 2 answers)
 - a. Logical
 - b. Physical
 - c. MAC
 - d. IP
 - e. Port
5. A CODEC depends on the
 - a. Data Link layer.
 - b. Network layer.
 - c. Presentation layer.
 - d. Application layer.
6. Which term defines a set of rules that determines the format of messages and the encapsulation process used to transmit data?
 - a. Segmentation
 - b. Protocol
 - c. Multiplexing
 - d. QoS
 - e. Reassembly

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Exercise 02:

1. Match the terms with their definition

Multiplexing	Splitting data streams into pieces suitable for transmission.
Protocol Data Unit (PDU)	Process of adding information or labels about the layer necessary for transmitting data.
QoS	Method for transmitting multiple data streams over the same communication channel or shared network medium.
Encapsulation	Formal rules describing the structure and process of network communication.
Segmentation	Term referring to a data packet.
Protocol	

2. Match the terms on the left, related to networks, with the corresponding layer on the right. (Not all options should be used).

Frame	Transport
IP Address	Network
MAC Address	Data Link
Logical Addressing	
Packets	
Physical Addressing	
Port Number	
Segments	
Bits	
Sequence Number	

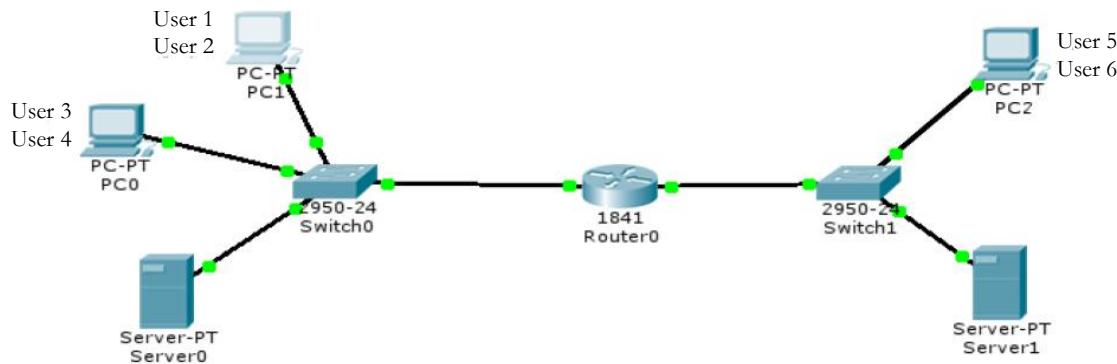
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3. Match the description of the function related to the OSI layers with the corresponding layer name.

Defines procedures for accessing the media	Application
Standardizes data formats between systems	Presentation
Routes packets based on a unique network address	Session
Cables, voltage, bits, and data rate	Transport
Manages sessions and user dialogues	Network
Defines interfaces between applications	Data Link
End-to-end delivery of messages across the network	Physical

Exercise 3: Data Transmission and Encapsulation

Given the following network:



1. Draw the layers of the OSI model at PC0, Router0, and Server1.
2. Draw the path followed (through the OSI model layers) by a message sent from PC0 to Server1 passing through Router0.
3. Provide the PDU format at each layer of the OSI model in the following cases:
 - a. User 1 sends their photo via Facebook (port: 80) to User 5.
 - b. User 5 replies with 'Thank you' to User 1.
 - c. User 4 downloads a file from Server1.

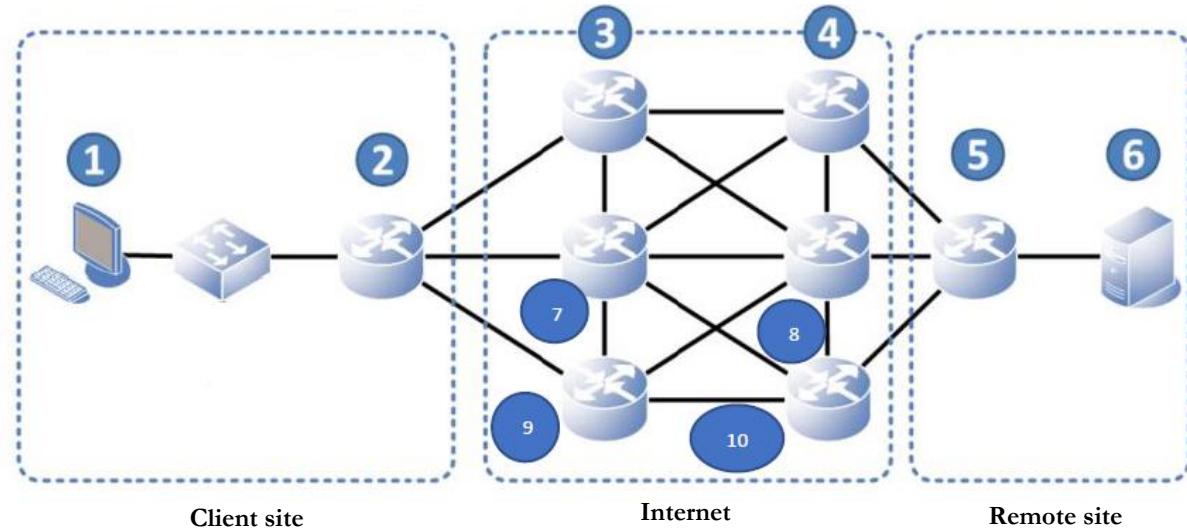
During the download performed by User 4, the connection was interrupted, and upon reconnecting, the user noticed that the download resumed exactly at the point where the connection was cut.

4. Which OSI layer is responsible for this operation?
5. What do we call this?

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Exercise 4: Introduction to Data Routing

Given the following diagram:



1. Draw the routing tables at the level of the devices, and explain the possible routing priorities between Machine 1 and Server 6.